

Attorney Docket No.: 0180367

**In the Claims:**

**Claim 1 (currently amended):** A method of forming an integrated circuit comprising:

providing a semiconductor substrate;

forming a gate dielectric on the semiconductor substrate;

forming a gate on the gate dielectric;

forming source/drain junctions in the semiconductor substrate;

forming an ultra-uniform silicide having approximately less than 3% variation in thickness on the source/drain junctions and on the gate within a thermal budget having a temperature dependent upon a silicide metal;

depositing an interlayer dielectric having contact holes therein above the semiconductor substrate;

forming contact liners in the contact holes within the thermal budget for forming the ultra-uniform silicide; and

forming contacts in the contact holes over the contact liners, whereby the contact liners are formed of a nitride of the material of the contacts.

**Claim 2 (currently amended):** The method as claimed in claim 1 wherein:

forming the contact liners uses an atomic layer deposition process using a temperature not greater than approximately 400 degrees centigrade.

Attorney Docket No.: 0180367

**Claim 3 (canceled)**

**Claim 4 (previously presented):** The method as claimed in claim 1 wherein:  
forming the ultra-uniform silicide forms an ultra-uniform nickel silicide.

**Claim 5 (original):** The method as claimed in claim 1 wherein:  
forming the contacts forms a tungsten material; and  
forming the contact liners forms a tungsten nitride material.

**Claim 6 (currently amended):** A method of forming an integrated circuit comprising:

- providing a semiconductor substrate;
- forming a gate dielectric on the semiconductor substrate;
- forming a gate on the gate dielectric;
- forming source/drain junctions in the semiconductor substrate;
- forming ultra-uniform nickel silicide having approximately less than 3% variation in thickness on the source/drain junctions and on the gate within a thermal budget having a temperature of less than about 400 degrees centigrade, the ultra-uniform nickel silicide being formed by using a very low power vapor deposition process;
- depositing an interlayer dielectric having contact holes therein above the semiconductor substrate;

Attorney Docket No.: 0180367

forming tungsten nitride contact liners in the contact holes within the thermal budget for forming the ultra-uniform nickel silicide; and  
forming tungsten contacts in the contact holes over the contact liners.

**Claim 7 (currently amended):** The method as claimed in claim 6 wherein:

forming the tungsten nitride contact liners uses an atomic layer deposition process  
using a temperature not greater than approximately 400 degrees centigrade.

**Claim 8 (canceled)**

**Claim 9 (previously presented):** The method as claimed in claim 6 wherein:

forming the ultra-uniform nickel silicide uses a nickel silicide metal having a thickness of not more than 50 Angstroms.

**Claim 10 (original):** The method as claimed in claim 6 wherein:

depositing the interlayer dielectric deposits a dielectric material having a dielectric constant selected from a group consisting of medium, low, and ultra-low dielectric constants.

**Claim 11 (currently amended):** An integrated circuit comprising:

a semiconductor substrate;  
a gate dielectric on the semiconductor substrate;

Attorney Docket No.: 0180367

a gate on the gate dielectric;  
source/drain junctions in the semiconductor substrate;  
an ultra-uniform silicide having approximately less than 3% variation in thickness  
on the source/drain junctions and on the gate;  
an interlayer dielectric having contact holes therein above the semiconductor  
substrate;  
contact liners in the contact holes; and  
contacts in the contact holes over the contact liners, whereby the contact liners are  
formed of a nitride of the material of the contacts.

**Claim 12 (previously presented):** The integrated circuit as claimed in claim 11  
wherein:

the ultra-uniform silicide is an ultra-uniform nickel silicide.

**Claim 13 (canceled)**

**Claim 14 (original):** The integrated circuit as claimed in claim 11 wherein:  
the interlayer dielectric is a dielectric material having a dielectric constant selected  
from a group consisting of medium, low, and ultra-low dielectric constants.

Attorney Docket No.: 0180367

**Claim 15 (original):** The integrated circuit as claimed in claim 11 wherein:  
the contacts in the contact holes are materials selected from a group consisting of tantalum, titanium, tungsten, copper, gold, silver, an alloy thereof, a compound thereof, and a combination thereof.

**Claim 16 (original):** The integrated circuit as claimed in claim 11 wherein:  
the contacts are a tungsten material; and  
the contact liners are a tungsten nitride material.

**Claim 17 (currently amended):** An integrated circuit comprising:  
a semiconductor substrate;  
a gate dielectric on the semiconductor substrate;  
a gate on the gate dielectric;  
source/drain junctions in the semiconductor substrate;  
an ultra-uniform nickel silicide having approximately less than 3% variation in thickness on the source/drain junctions and on the gate,  
an interlayer dielectric having contact holes therein above the semiconductor substrate;  
tungsten nitride contact liners in the contact holes; and  
tungsten contacts in the contact holes over the contact liners.

Attorney Docket No.: 0180367

**Claim 18 (canceled)**

**Claim 19 (original):** The integrated circuit as claimed in claim 17 wherein:  
the interlayer dielectric is a dielectric material having a dielectric constant selected from a group consisting of medium, low, and ultra-low dielectric constants.

**Claim 20 (original):** The integrated circuit as claimed in claim 17 wherein:  
the nickel silicide further comprises arsenic doping.

**Claim 21 (new):** The method as claimed in claim 1 wherein:  
forming the ultra-uniform silicide includes depositing the silicide metal using a vapor deposition process with a power level below 500 watts direct current.

**Claim 22 (new):** The method as claimed in claim 1 wherein:  
forming the ultra-uniform silicide includes depositing the silicide metal at a deposition rate below approximately 7.0 Angstroms per second.

**Claim 23 (new):** The method as claimed in claim 1 wherein:  
forming the ultra-uniform silicide uses a nickel silicide metal having a thickness of not more than 50 Angstroms.

Attorney Docket No.: 0180367

**Claim 24 (new):** The method as claimed in claim 6 wherein:  
forming the ultra-uniform nickel silicide includes depositing a nickel silicide metal  
at a deposition rate below approximately 7.0 Angstroms per second.